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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,277	08/01/2003	Chang Wei	124853 (GEGRC 0106 PA)	5091
6147	7590	05/02/2006	EXAMINER	
GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 NISKAYUNA, NY 12309			ROSENBERGER, FREDERICK F	
			ART UNIT	PAPER NUMBER
			2884	

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/632,277	Applicant(s) WEI ET AL.	
	Examiner Frederick F. Rosenberger	Art Unit 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-37 is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 28 February 2006 has been entered.

2. Applicant's reply, filed 28 February 2006, has been received and entered. Accordingly, claims 1, 20, 27, and 34 have been amended. No claims have been cancelled. No new claims have been added. Thus, claims 1-37 are currently pending in this application.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 4, 5, 11, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Englert et al. (US Patent # 4,720,426).

In regards to claim 1, Englert et al. disclose a reflector system for use on scintillator elements in a scintillator array of a CT imaging system, the scintillator elements having a reflective material coupled along its surfaces defined within the gaps between scintillator elements **40** (see Figures 3 and 8), the reflective material comprising (column 5, lines 15-25):

A smoothening layer, in the form of clear polymer layer **58** (Figure 6);

A metallic reflective layer, in the form of silver reflection layer **60** (Figure 6), applied to the smoothening layer **58**; and,

A top layer, in the form of protective layer **62** (Figure 6), applied to the metallic reflective layer **60** to provide an environmental barrier.

The limitation that the scintillator array is two-dimensional amounts to a recitation of the intended use of the claimed reflective material. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the present case, Englert et al. discloses the claimed layer structure, as detailed above. Englert et al. also disclose the applicability of the layer structure to individual scintillation elements (see Figure 8), which could then be assembled into a one-dimensional or two-dimensional array. As such, Englert et al. is interpreted as meeting the limitations of the claim.

In regards to claim 4, Englert et al. disclose that the smoothening layer **58** is about 0.0001 inches thick (column 5, lines 57-58), which converts to about 2.5 μ m.

In regards to claim 5, Englert et al. disclose that the smoothening layer **58** is a clear acrylic layer (column 5, lines 54-56), which would constitute a low viscosity polymer material transparent to the emission wavelengths.

In regards to claim 11, Englert et al. disclose that the metallic reflective layer **60** is preferably silver (column 6, lines 1-2).

In regards to claim 12, Englert et al. disclose that the top layer **62** serves to protect the metal reflecting layer **60**, and thus serves as a barrier layer. Further, Englert et al. disclose that the top layer **62** has a thickness of about 0.0005 inches (column 6, lines 4-6), which converts to about 12.5 μ m.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 6, 9, 10, 13, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Englert et al., as applied to claims 1 and 5 above.

With regards to claim 6, Englert et al. disclose all the limitations of parent claim 5, as discussed above. However, Englert et al. are silent with regards to the claimed materials for the low viscosity polymer material. It would have been obvious for one having ordinary skill in the art at the time the invention was made to use silicon hardcoats, styrene acrylates, UV curable hardcoats, or polyvinylidene chloride for the polymer material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

With regards to claims 9 and 10, Englert et al. disclose all the limitations of parent claim 1, as discussed above, but are silent with regards to the thickness of the metallic reflective layer **60**. It would have been obvious for a person having ordinary skill in the art at the time the invention was made to choose a thickness for the metallic reflective layer between 2000 and 3000 Angstroms, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claim 13, Englert et al. disclose that the top layer **62** serves to protect the metal reflecting layer **60**, and thus serves as a barrier layer. Further, Englert

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et al. disclose that the top layer **62** has a thickness of about 0.0005 inches (column 6, lines 4-6), which converts to about 12.5 μ m. It would have been obvious for a person having ordinary skill in the art at the time the invention was made to choose a thickness for the top layer between 1000 and 5000 Angstroms, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claim 18, Englert et al. disclose that the top layer **62** is polyester (column 6, lines 4-5) and encapsulates the layer arrangement by virtue of being the outermost layer (column 5, lines 22-25). Englert et al. further disclose that the thickness of the layer is within 10% of 12.5 μ m (column 6, lines 4-5). It would have been obvious for a person having ordinary skill in the art at the time the invention was made to choose a thickness in the range from 5 μ m to 10 μ m, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claim 19, Englert et al. discloses that the top layer is a polyester (column 6, lines 4-6). Englert et al. is silent with regards to the claimed materials for the polymeric encapsulant comprising the top layer. It would have been obvious for one having ordinary skill in the art at the time the invention was made to use UV cured hardcoat, a styrene acrylate, a polyvinylidene chloride, or an amorphous PTFE for the top layer, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

8. Claims 2, 3, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Englert et al., as applied to claim 1 above, and further in view of Yoshida et al. (US Patent Application Publication # 2002/0196628).

With regards to claim 2, Englert et al. disclose all the limitations of parent claim 1, as discussed above. However, Englert et al. are silent with regards to smoothening layer being etched.

Yoshida et al. teach that the substrate **A** (Figure 1), equivalent to the smoothening layer **58**, may be etched via corona discharge or glow discharge, equivalent to an Argon plasma etch, to enhance the surface smoothness, thus providing a smooth first layer for the buildup of additional layers (paragraph 61).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to etch the smoothening layer of Englert et al. to enhance the smoothness of the smoothening layer for the buildup of subsequent layers, as taught by Yoshida et al.

With regards to claims 3 and 7, Englert et al. disclose all the limitations of parent claim 1, as discussed above. However, Englert et al. are silent with regard to an adhesion layer provided between the smoothening layer and the metallic reflecting layer.

Yoshida et al. teach an underlying layer **B** (Figure 1), equivalent to the adhesion layer of the claimed invention, which connects the metal layer **C** to the substrate film **A**. The adhesion layer is a thin metal film (paragraph 63) with a thickness in the range of 5-50nm for connecting the silver metal layer to the substrate film. The use of a metal as

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the adhesion layer with a thickness in the given range provides a sufficient barrier effect while promoting good adhesion between the metal layer and the polymer film (paragraphs 12-13 and 73).

Thus, it would have been obvious for a person having ordinary skill in the art to modify Englert et al. to include a metal adhesion layer with a thickness in the range of 5-50nm between the metallic reflective layer and the polymer smoothening layer to improve adhesion between the layers while protecting the metallic reflecting layer, as taught by Yoshida et al.

With regards to claim 8, Yoshida et al. further disclose that the metal for the adhesion layer may be titanium, tungsten, chromium, and zirconium (paragraph 63).

9. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Englert et al., as applied to claim 1 above, and further in view of Kingsley et al. (US Patent # 5,179,284).

With regards to claim 14, Englert et al. disclose all the limitations of parent claim 1, as discussed above. However, Englert et al. are silent with regards to the top layer comprising a barrier coating layer selected from the group of a metallic barrier coating layer, an inorganic barrier coating layer, and a ceramic barrier coating layer. Instead, Englert et al. disclose a polymeric encapsulant comprising the top layer.

Kingsley et al. teach that when using silver as a reflective layer, it is advantageous to include a second metal layer closest to the environment to serve as a barrier layer. This second metal layer, made of gold or a metal of similar reactivity,

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serves to protect the silver layer, as silver is known to exhibit a high degree of reactivity (column 4, lines 16-21).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to include a second metal layer of gold in the top layer as a barrier coating layer so as to protect degradation of the reactive silver layer, as taught by Kingsley et al.

With regards to claim 15, Englert et al. already disclose a polymeric encapsulant layer, in the form of polymeric protective layer 62 (Figure 6).

With regards to claim 16, Englert et al. disclose that the thickness of the protective layer is within 10% of 12.5 μ m (column 6, lines 4-5). It would have been obvious for a person having ordinary skill in the art at the time the invention was made to choose a thickness in the range from 5 μ m to 10 μ m for the polymeric encapsulant layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claim 17, Englert et al. discloses that the top layer is a polyester (column 6, lines 4-6). Englert et al. is silent with regards to the claimed materials for the polymeric encapsulant comprising the top layer. It would have been obvious for one having ordinary skill in the art at the time the invention was made to use UV cured hardcoat, a styrene acrylate, a polyvinylidene chloride, or an amorphous PTFE for the top layer, since it has been held to be within the general skill of a worker in the art to

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select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Allowable Subject Matter

10. Claims 20-37 are allowed.

11. The following is a statement of reasons for the indication of allowable subject matter:

Independent claim 20 discusses forming a reflector for a two-dimensional scintillator array, wherein a smoothening layer is applied to the top surface and four sides of each scintillator element of the two dimensional scintillator array. While Kingsley and Akai do suggest some aspects of the invention, there is no provision in any of the cited prior art for forming such the claimed layer arrangement on the top surface and four sides of a two dimension array. It is also noted that Englert et al. disclose a similar layer arrangement but fail to teach the smoothening layer applied directly to the top surface and the four sides of the scintillator array and the two-dimensional nature of the array. As such, claim 20 and its associated independent claims would be allowable.

Independent claim 27 recites the limitation of a smoothening layer and a metallic reflective layer applied to the top and four side surfaces of the scintillator element of a two dimensional array, wherein the metal layer is formed from a reducing agent and metal complex. Independent claim 34 discusses a method of forming a reflector for a two dimensional scintillator array, wherein the top surface and four sides of each

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scintillator element of the two dimensional array are coated with a smoothening layer and a metal reflecting layer formed from a reducing agent and metal complex. While Kingsley, Akai, and Bahls do suggest some aspects of the invention, there is no provision in any of the cited prior art for forming such a layer arrangement on the top surface and four sides of each scintillator element of the two dimensional array. It is also noted that Englert et al. disclose a similar layer arrangement, but fail to teach the smoothening layer applied directly to the top surface and four sides of the scintillator array, the two dimensional nature of the array, and the formation of the metallic reflective layer from a reducing agent and metal complex. As such, claims 27 and 34, along with their associated dependent claims would be allowable.

Response to Arguments

12. Applicant's arguments, see page 9, filed 28 February 2006, with respect to the rejection(s) of claim(s) 1-19 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Englert et al., as described above. Englert et al. teaches the claimed layer structure for use in a scintillator array.

13. Applicant's arguments, see page 9, filed 28 February 2006, with respect to the rejection of claims 20-37 have been fully considered and are persuasive. The rejection of claims 20-37 has been withdrawn.


Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick F. Rosenberger whose telephone number is 571-272-6107. The examiner can normally be reached on Monday-Friday 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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